Empirical density estimation and back-testing of Value at Risk (VaR) from parametric volatility models

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Abstract

This paper forecasts one-day-ahead foreign exchange volatility using parametric models and compares their empirical forecasting performance of Value at Risk of five spot exchange rates; namely, the Kenyan Shilling versus the Euro, U.S. Dollar, Japanese Yen, Great British Pound and the South Africa Rand. Univariate GARCH family models (GARCH, E-GARCH, GARCH-M and FI-GARCH) are compared against the Discrete-time Stochastic Volatility Model. The daily mean exchange rates from January 2007 to December 2016 are used. Comparison analysis is divided into in-sample and out-of-sample forecasting performance which is evaluated using exceedance-based back-testing methods of conditional coverage, independence and unconditional coverage.